TEC

Thermo-Electrical Controller

SHORTFORM USER MANUAL

HIGH Q LASER PRODUCTION GMBH

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How to use the Thermo-Electric-Controller:

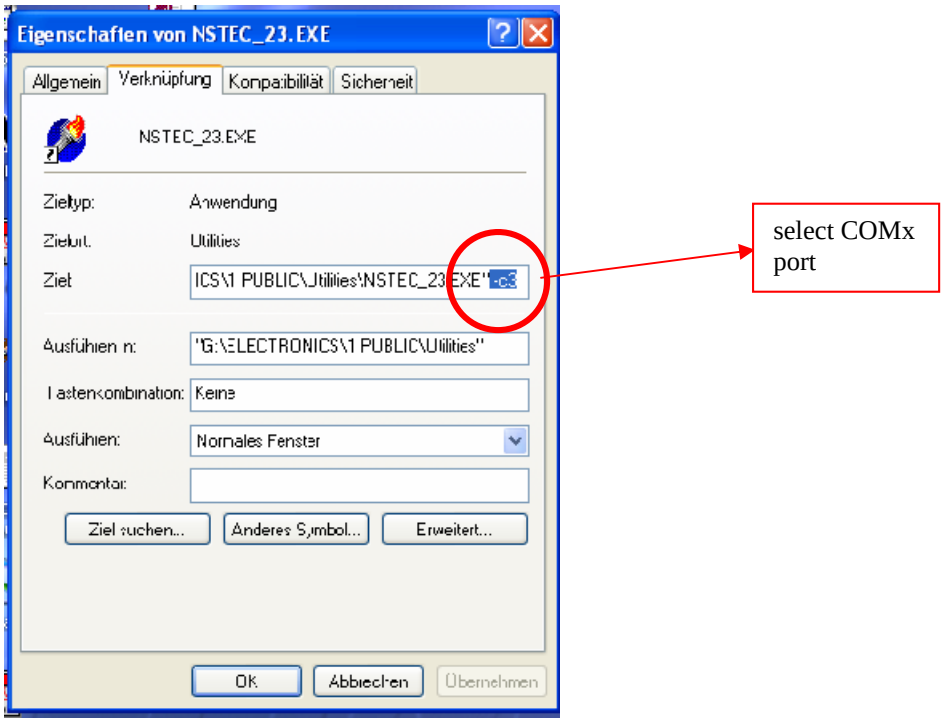
PDG back panel connections:

- Make sure that the main power switch of the TEC electronic is in OFF position labelled “0” and connected to the mains with a 3-pin power cord to ensure proper grounding.
- Connect the RS232-RS422 converter to your serial PC interface COM1 and the other end to the corresponding plug at the TEC or LC1 controller, labelled “COM”.
- Connect the TEC-Cable at the TEC or LC1 controller at the plug with AUX1. Connect the other end at the corresponding plug at the laser head.

Operate the PDG with the Windows GUI:

Communication Settings

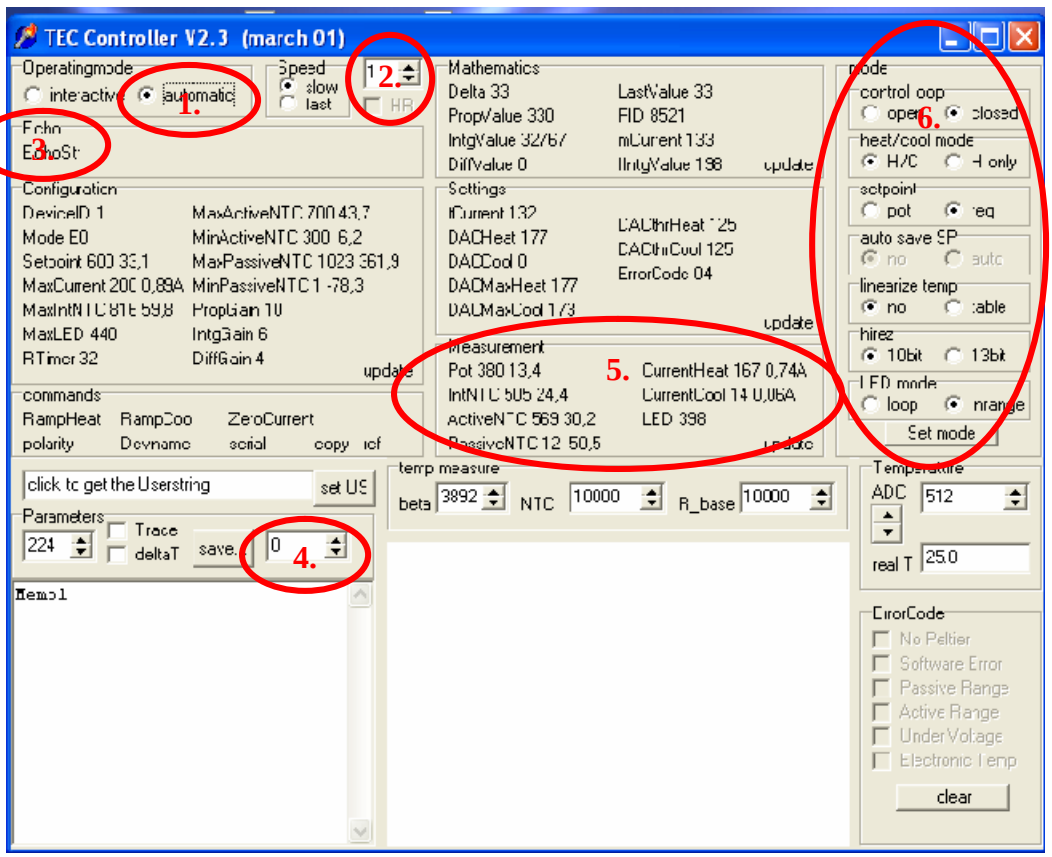
If you use d different communication por from COM1, it is necessary to generate a link from the NSTEC_23.exe. At the target path of the link properties you can select the port by adding “ –c2” for COM2, “ –c3” for COM3 and so on.



Change of configuration

After switching on the TEC with the main switch on the back side of the controller, start the Windows graphical user interface (GUI) with a double-click on the label “NSTEC_23.exe”

The following utility window appears:



- 1. select "automatic" to enable the continuously update of the utility values
- 2. select the required device ID. If only one TEC is used the ID is 1, if two TEC's are connected the ID is 1 & 2.
- 3. check serial communication by double clicking on the label "Echo". If communication works a hex string is displayed next to the label "EchoStr".
- 4. Set the required parameters in the configuration field. In order to change a value you have to write the value into field 4 (figure above) and double click on the label of the value. If the value is changed the new value will be displayed.
- 5. In the measurement field the actual values are displayed.
- In order to change the mode the operating mode have to be set to interactive. Then you could change the settings and click on the button "Set mode". Afterward you could change back to automatic operation mode.

Description of Utility Values

Operation mode

Interactive	-> display updating is disabled
Automatic	-> display is updated automatically

Speed

Fast	-> display is updated every 1 second
Slow	-> display is updated every 3 second

Echo

If you double click on label "Echo" a HEX String will be displayed if communication works

Configuration

DeviceID	-> actual device ID
Mode	-> actual mode setting
Setpoint	->temperature setpoint
MaxCurrent	-> maximal TEC current (changes only after power on/off active)
MaxIntNTC	-> maximal electronic temperature (must be set to 816)
MaxLED	-> minimal internal supply voltage (must be set to 440)
RTimer	-> internal timer (must be set to 32)
MaxActivNTC	-> maximal temperature on active side of thermo electronic element
MinActiveNTC	-> minimal temperature on active side of thermo electronic element
MaxPassiveNTC	-> not used (should be set to 1023)
MinPassiveNTC	-> not used (should be set to 1)
PropGain	-> proportional gain of PID controller
IntgGain	-> integral gain of PID controller
DiffGain	-> differential gain of PID controller

Commands

not used

Parameters

Trace	-> if enabled the serial communication protocol will be displayed
deltaT	-> if enabled the temperature difference (error signal of control loop) will be displayed

Mathematics

Digital values of internal PID algorhyhtm

Settings

Digital value of internal electronic parameters

Measurement

Pot	-> not used
IntNTC	-> temperature of internal electronics
ActiveNTC	-> actual temperature of active side of thermo electronic element
PassiveNTC	-> not used
currentHeat	-> actual heat current
currentCool	-> actual cool current
LED	-> actual value of voltage supply of internal electronics

Mode

Control loop	-> should be set to “closed loop”
Heat cool mode	-> setting depends on laser system (see manual)
Setpoint	-> should be set to “reg”
Linearize temp	-> should be set to “no”
Hirez	-> setting depends on laser system (see manual)
LED mode	-> should be set to inrange

Error Code

No Peltier	-> Peltier is not connected (check cable connection)
Software Error	-> internal software timing error
Active Range	-> temperature is out of range (check max min levels and setpoint)
Passive Range	-> (set MaxPassiveNTC to 1023 and MinPassiveNTC to 1)
Under Voltage	-> internal supply voltage error (check MaxLED value should be 440)
Electronic Temp	-> internal electronic temperature error (check MaxIntNTC value should be 816)